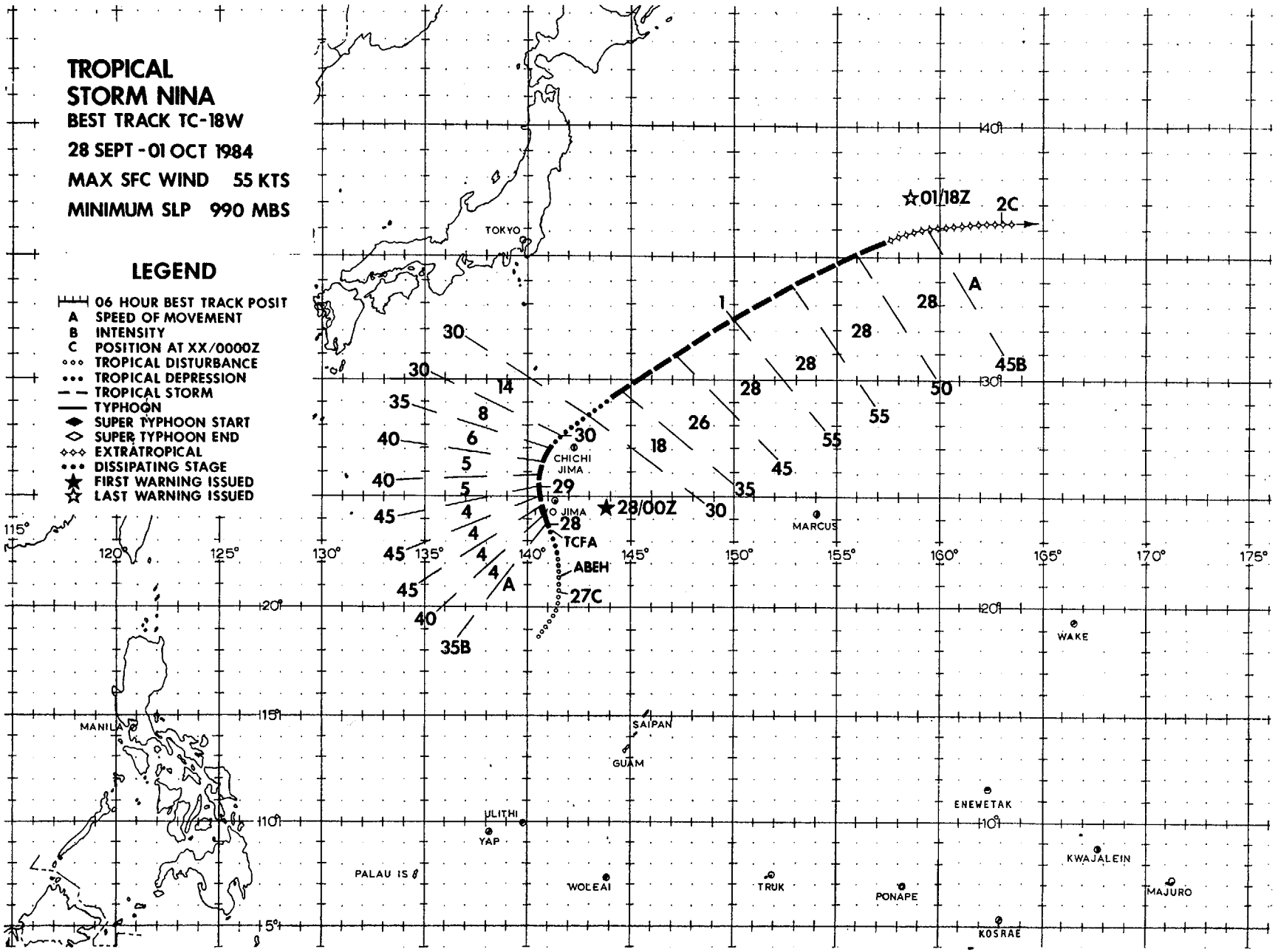
TROPICAL
STORM NINA
BEST TRACK TC-18W
28 SEPT - 01 OCT 1984
MAX SFC WIND 55 KTS
MINIMUM SLP 990 MBS
LEGEND
06 HOUR BEST TRACK POSIT
A SPEED OF MOVEMENT
B INTENSITY
C POSITION AT XX/0000Z
TROPICAL DISTURBANCE
TROPICAL DEPRESSION
TROPICAL STORM
TYPHOON
SUPER TYPHOON START
SUPER TYPHOON END
EXTRATROPICAL
DISSIPATING STAGE
FIRST WARNING ISSUED
LAST WARNING ISSUED
☆01/18Z
2C
★28/00Z
TCFA
ABEH
27C
35B
45B
TOKYO
CHICHI JIMA
MARCUS
WAKE
SAIPAN
GUAM
MANILA
ULITHI
YAP
PALAU IS
WOLEAI
TRUK
PONAPE
KOSRAE
ENEWETAK
KWAJALEIN
MAJURO
115°
120°
125°
130°
135°
140°
145°
150°
155°
160°
165°
170°
175°
40°
30°
20°
15°
10°
5°

Tropical Storm Nina was the third tropical storm to develop in the monsoon trough during the latter half of September. Despite originating in a region favorable for cyclogenesis, Nina never intensified beyond 55 kt (28 m/s). This was due to the inability of an upper-level anticyclone to persist over the storm. The last phase of Nina's life was noteworthy due to the storm's reintensification and assimilation of Tropical Storm Maury into its circulation.

On the 25th of September, a mid-latitude frontal system moved across the western North Pacific. As the front passed north of the monsoon trough, the trough was pulled to the northeast on the 26th. At 270000Z, the trough extended from the central Philippine Sea northeast to near Marcus Island (Minami Tori-Shima (WMO 47991)) where it became connected with the trailing edge of the cold front. Embedded in this trough were several weak circulations; most noticeable were the ones northeast and northwest of Guam. These would later develop into Tropical Storms Maury and Nina respectively.

Synoptic data at 270000Z indicated a closed 1004 mb circulation had formed 500 nm (926 km) north-northwest of Guam. The convection associated with the disturbance was poorly organized, but a large upper-level anticyclone north of Guam was providing good outflow channels to the south and east. During the following twelve hours the circulation and the associated convection moved north and consolidated. At 271200Z numerous ship reports indicated the system had intensified and was detaching from the trough. Tropical cyclone development during the next 24 hours now became a distinct possibility. Consequently, the Significant Tropical Weather Advisory (ABEH PGTW) was reissued at 271600Z upgrading the potential for development of this disturbance to "fair". This was followed by a TCFA at 272030Z based on satellite imagery which showed the disturbance was consolidating and becoming comma shaped.

The first aircraft reconnaissance flight into Nina took place late on the 27th and found only a sharp trough oriented northeast to southwest with an MSLP of 998 mb. However, a band of 30 to 40 kt (15 to 20 m/s) winds were observed south of the trough axis. This prompted the issuance of the first warning at 280000Z.

During the following 24 hours, Nina moved slowly north reaching an intensity of 45 kt (23 m/s) at 281200Z. Nina failed to develop a central dense overcast (CDO) as would be expected with normal tropical cyclone development. Instead, due to the displacement of the upper-level anticyclone to the east of the low-level circulation,

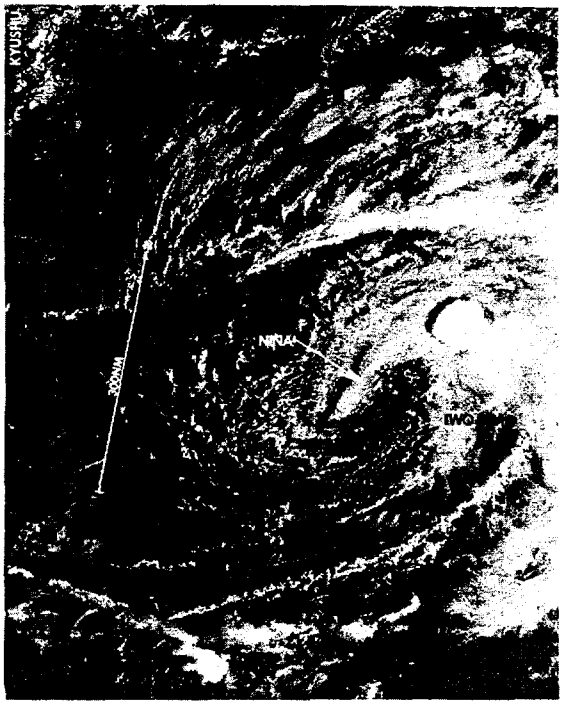

Figure 3-18-1. The broad exposed low-level circulation of Tropical Storm Nina (290102Z September NOAA visual imagery).

Nina more closely resembled a subtropical system. The convection was located poleward and eastward of the low-level center, and the radius of maximum winds was removed from the center. In addition, reconniassance aircraft found only sight temperature increases at the center.

This displacement of the convection north and east of the low-level center introduced uncertainty in the storm's position on the night of 28 September when the low-level circulation was poorly defined. Analysis of satellite imagery indicated that the upper-level circulation center passed east of Iwo-Jima (WMO 47981), but the surface winds at Iwo-Jima remained from the southeast until about 281800Z. This clearly indicates the surface circulation passed west of the island. During this time, synoptic data was essential in fixing the surface center since the low-level center was not locatable on satellite imagery.

Early on the 29th, Nina entered the westerlies and the convection was displaced even further to the east remaining under the strongest upper-level diffluence. This resulted in a weakening of the storm. The broad low-level circulation was now continuously exposed, generally 100 to 180 nm (185 to 333 km) west of the main convection (Figure 3-18-1).

By early on the 30th, Nina had weakened to depression strength with reconnaissance aircraft unable to locate the low-level circulation center and satellite imagery indicating several possible low-level circulation centers. Nina was now forecast to dissipate over water during the next 12 to 24 hours. However, this weakening was to be temporary.

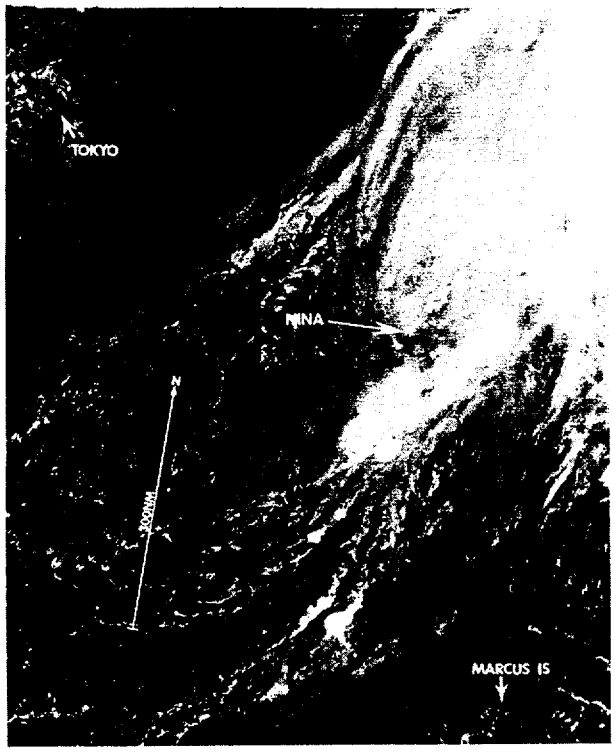

Figure 3-18-2. Tropical Storm Nina at maximum intensity. Maury is now assimilated into Nina's circulation (0100Z2Z October DMSP visual imagery).

Between 300600Z and 301800Z, the low-level circulation moved rapidly northeast under the active convection resulting in a rapid reintensification of Nina. During this intensification, Tropical Storm Maury became incorporated into the larger circulation of Nina. However, there is no evidence to indicate that this intensification was due to the presence of Maury. At 0000Z on 1 October, Nina reached maximum intensity of 55 kt (28 m/s) (Figure 3-18-2).

Early on the first of October, extratropical transition began. The convection rapidly decreased during the day as Nina continued to the northeast. Nina became extratropical between 011200Z and 011500Z, with the final warning being issued at 011800Z.